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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/579,389

06/14/2006

Takafumi Suzuki

2006-0741A

6578

513

7590

08/20/2008

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EXAMINER

LACLAIR, DARCY D

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

08/20/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/579,389	Applicant(s) SUZUKI ET AL.	
	Examiner Darcy D. LaClair	Art Unit 4171	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 3-7 and 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,8-13 and 15-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-27 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/15/2006, 7/13/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of group "e" drawn to organic acids, in the reply filed on June 14, 2006 is acknowledged. The traversal is on the ground(s) that unity of invention was found to exist in the PCT International Preliminary Report. This is not found persuasive because under PCT Rule 13.1, lack of unity is may be determined by the presence or absence of a special technical feature. *"Whether or not any particular technical feature makes a "contribution" over the prior art, and therefore constitutes a "special technical feature," should be considered with respect to novelty and inventive step. For example, a document discovered in the international search shows that there is a presumption of lack of novelty or inventive step in a main claim, so that there may be no technical relationship left over the prior art among the claimed inventions involving one or more of the same or corresponding special technical features, leaving two or more dependent claims without a single general inventive concept."* MPEP § 1850(II).

2. The broadest claim of the application teaches a calcium hydroxide represented by $\text{Ca}(\text{OH})_{2-nx}(\text{A}^{n-})_x$, where the anion can be selected from a silicon-based compound, a phosphorous-based compound, an aluminum-based compound, an inorganic acid, and an organic acid. The abstract of Kunio et al. (JP 57-106521, abstract provided by applicant on the IDS) teaches a finely crushed quick lime (CaO) slacked in the presence of phosphoric acid, sulfuric acid, or silicic acid to obtain to obtain slacked lime. Applicant claims a calcium hydroxide obtained by the same method. This presents

three of applicant's possible species (phosphorous-based compounds or silicon based compounds, and inorganic acids), and demonstrates that the alleged special technical feature of the broadest claim is known in the prior art. The knowledge of this alleged special technical feature in the prior art demonstrates lack of unity.

3. Claims 3 and 14 are additionally withdrawn as being not drawn to the elected invention, as the A^{n-} is silicon or aluminum compounds, and not organic acids.

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

4. Claims 11 and 17 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. These claims require that calcium hydroxide is surface treated with one surface treating agent selected from a group including those presented in claim 1. The anion of claim 1 is present in a minor portion, and would readily adhere to the surface during digesting (or slacking). The intended use of this treatment, based on applicant's specification, is to improve the surface area and activity of the calcium hydroxide. (applicant's ¶16) This clearly constitutes a surface treatment. These claims broaden the group presented (and restricted) in claim 1.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-2, 3-11, and 25 are rejected under 35 U.S.C. 102(a) as being clearly anticipated by Takafumi et al. (JP 2003-327427).

7. Claim 1 requires calcium hydroxide represented by the formula $\text{Ca}(\text{OH})_{2-nx}(\text{A}^{n-})_x$, where A^{n-} represents an anion derived from an organic acid, and where x is a number of 0.01 to 0.2. Takafumi teaches a quicklime generated by a digestive reaction with an organic acid. (¶7) The amount of the additive should be from 0.1 to 2 mol%, (¶9) which is consistent with Applicant's formula.

8. Claim 2 requires that A^{n-} is $\text{C}_6\text{H}_7\text{O}_7^-$, $\text{C}_6\text{H}_6\text{O}_7^-$, or $\text{C}_6\text{H}_5\text{O}_7^-$, or a mixture thereof. These are various ions of citric acid or a citrate based salt. Takafumi teaches citric acid and its salts. (¶8)

9. Claim 8 requires that the organic acid is at least one selected from citric acid, tartaric acid, ethylenediamine tetraacetic acid, maleic acid, succinic acid, and their salts.

10. Claim 9 requires the calcium hydroxide of claim 1, having an average secondary particle diameter of 0.1 to 10 μm . Takafumi teaches that the secondary particle diameter should be 2 to 10 micrometers. (¶5)

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11. Claim 10 requires calcium hydroxide having a specific surface area of 5 to 40 m²/g. Takafumi teaches a BET specific surface area of 5 to 40 cm²/g. (¶5)

12. Claim 11 requires that the calcium hydroxide is surface treated with at least one surface treating agent selected from the presented group. Takafumi teaches that it is possible to use an additive agent, as described in the arguments with respect to claim 1 (¶7, 14) and the purpose of this surface treatment would be to generate a modification to the reactivity and surface area of the calcium hydroxide, making it more compatible with resins. (¶13) This clearly constitutes a surface treatment.

13. Claim 25 requires a stabilizer for synthetic resins which comprises a calcium hydroxide compound as described in claim 1. Takafumi indicates that this treatment is for the purpose of improving the resin compatibility, (¶13) and therefore is made with the intention of stabilizing the overall resin composition.

14. Claims 1-2, 8-11 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Hidekazu et al. (JP 09-278435)

15. Claim 1 requires calcium hydroxide represented by the formula $\text{Ca}(\text{OH})_{2-nx}(\text{A}^{n-})_x$, where A^{n-} represents an anion derived from an organic acid, and where x is a number of 0.01 to 0.2. Hidekazu teaches calcium oxide digested with water and lactic acid, citrate (citric acid), tartaric acid, and their salts (¶13-14) at an amount 0.1 to 10%. (¶17) This digestion is the same method presented by applicant to arrive at the claimed calcium hydroxide (applicant's ¶37) and the percentages taught by Hidekazu are small enough to be consistent with the molar ratio claimed by applicant. If applicant's calcium

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hydroxide and organic acid were roughly equivalent molecular weights, the organic acid would be present roughly 0.01:2 to 0.2:2, or in a range 0.5% wt to 10% wt. This may not be strictly true of the molecular weights in question. If the acid was double the molecular weight of the calcium, applicant's formula would require the organic acid to be present in a range of 1% wt to 20% wt. Regardless of a varying molecular weight of the organic acid (A^{n-}), a significant portion of the potential ranges are covered by Hidekazu's teaching.

16. Claim 2 requires that A^{n-} is $C_6H_7O_7^-$, $C_6H_6O_7^-$, or $C_6H_5O_7^-$, or a mixture thereof. These are various ions of citric acid or a citrate based salt. Hidekazu teaches "oxy-carboxylic acid" (abstract), and later lists citric acid among the useful acids. (¶14)

17. Claim 8 requires that the organic acid is at least one selected from citric acid, tartaric acid, ethylenediamine tetraacetic acid, maleic acid, succinic acid, and their salts. Hidekazu teaches citric acid and tartaric acid as preferred organic acids. (¶14)

18. Claim 9 requires the calcium hydroxide of claim 1, having an average secondary particle diameter of 0.1 to 10 μm . Hidekazu presents several examples of preparation. In each case, the calcium hydroxide is ground to 150 μm or less. (¶25-41) Hidekazu also indicates the need for microatomizing calcium hydroxide to improve reactivity, (¶4) and increasing the specific surface area (¶6), so it is likely that the particles would be ground further, into the "or less" range, which would put the particles into the range required by applicant. Additionally, the size of the particles will be directly related to the specific surface area of the particles, and the particles have a surface area consistent

with that claimed by applicant. (see office action ¶10, below) This indicates that the size of Hidekazu's particles must be consistent with those of applicant.

19. Claim 10 requires calcium hydroxide having a specific surface area of 5 to 40 m²/g. Hidekazu teaches a specific surface area between 23.8 and 35.5 m²/g, for the inventive examples. (Table 1)

20. Claim 11 requires that the calcium hydroxide is surface treated with at least one surface treating agent selected from the presented group. Among that group (i) enumerates the groups presented in claim 1, including "an organic acid." As discussed in paragraphs 4 and 7, above, this limitation is met by the organic acids of Hidekazu, which constitute a surface treatment.

21. Claim 25 requires a stabilizer for synthetic resins which comprises a calcium hydroxide compound as described in claim 1. Hidekazu teaches an improved calcium hydroxide which has an enhanced reactivity and increased specific surface area. (abs, ¶1) These properties would improve the ability of this calcium hydroxide to act as a stabilizer in a resin composition. Additionally, this calcium hydroxide meets applicant's limitations, and would therefore necessarily behave in the same manner as applicant's claimed invention, which is to say it would function as a stabilizer in synthetic resins.

Claim Rejections - 35 USC § 103

22. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

23. Claims 12-13, 15-19, and 21, 24, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyata et al. (US 6,592,834) in view of Hidekazu et al. (JP 09-278435).

Description and Relationship of the Prior Art

24. Miyata teaches a calcium hydroxide in a particle size distribution 2 μm or less, which is surface treated with an anionic surfactant, and its use, (abs) which is use in a resin composition. (col 1 ln 59-64) Miyata teaches that the calcium hydroxide should be a wet-pulverized slaked lime with impurities, (col 2 ln 33-38) and that this treatment process is an improvement over conventional calcium hydroxide, which is poorly dispersible in resin compositions. (col 1 ln 36-39) Miyata fails to specifically teach a calcium hydroxide treated with organic acid.

25. Hidekazu teaches an improved calcium hydroxide which has an enhanced reactivity and increased specific surface area. (abs, ¶1) Given the desire of Miyata to improve the calcium hydroxide by a slacking process in the presence of an additive or impurity, in order to improve the dispersibility and functionality in a resin composition, it would be obvious to consider the use of an organic acid, as taught by Hidekazu, as the impurity or additive in the slacking process in order to reap the benefits of improved surface area and reactivity.

With Regard to the Claims

26. Claim 12 requires a resin composition comprising 100 parts of synthetic resin, and 0.1 to 10 parts by weight of calcium hydroxide calcium hydroxide represented by

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the formula $\text{Ca}(\text{OH})_{2-nx}(\text{A}^{n-})_x$, where A^{n-} represents an anion derived from an organic acid, and where x is a number of 0.01 to 0.2. Miyata teaches that preferably in 0.5 to 10 parts by weight calcium hydroxide should be incorporated into 100 parts by weight of a synthetic resin. (col 2 ln 11-15) Miyata is clear on the benefits of being treated with an additive during slacking, (col 1 ln 36-39) suggesting a silicone, alumina, or ferrous compound (col 2 ln 31-41). It would have been obvious (see above) to incorporate an organic acid treatment, as taught by Hidekazu in order to reap the benefits of such a treatment on specific surface area and surface activity. This would improve the dispersibility and function in the resin, which is desired by Miyata (col 1 ln 54-67)

27. Claim 13 requires a resin composition in which the A^{n-} is $\text{C}_6\text{H}_7\text{O}_7^-$, $\text{C}_6\text{H}_6\text{O}_7^-$, or $\text{C}_6\text{H}_5\text{O}_7^-$, or a mixture thereof. These are various ions of citric acid or a citrate based salt. Hidekazu teaches "oxy-carboxylic acid" (abstract), and later lists citric acid among the useful acids. (¶14)

28. Claim 15 requires the resin of claim 12 where the calcium hydroxide has an average secondary particle diameter of 0.1 to 10 μm . Miyata teaches a calcium hydroxide in a particle size distribution 2 μm or less, (abs) which is consistent with applicant's range. Miyata further teaches that the calcium hydroxide is wet-pulverized (col 2 ln 33) Hidekazu presents several examples of preparation. In each case, the calcium hydroxide is ground to 150 μm or less. (¶25-41) Hidekazu also indicates the need for microatomizing calcium hydroxide to improve reactivity, (¶4) and increasing the specific surface area (¶6), so it is likely that the particles would be ground further, into the "or less" range, which would put the particles into the range required by applicant.

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Additionally, the size of the particles will be directly related to the specific surface area of the particles, and the particles have a surface area consistent with that claimed by applicant. (see office action ¶10, below) This indicates that the size of Hidekazu's particles must be consistent with those of applicant. Both Miyata and Hidekazu teach that the particles shall be pulverized or ground, and a small size to insure high surface area. It would be reasonable for one of ordinary skill in the art to seek a small particle, and for Hidekazu's particle to be ground until it was consistent with the size taught by Miyata, which is consistent with applicant's size range.

29. Claim 16 requires that resin of claim 12 contains a calcium hydroxide with a specific surface area of 5 to 40 m²/g. Miyata teaches a BET specific surface area of 7 to 20 m²/g. Hidekazu teaches a specific surface area between 23.8 and 35.5 m²/g, for the inventive examples. (Table 1) In both cases, these correspond to applicant's range.

30. Claim 17 requires a resin where the calcium hydroxide is surface treated with at least one surface treating agent selected from the presented group. Among that group (i) enumerates the groups presented in claim 1, including "an organic acid." As discussed in paragraphs 4 and 7, above, this limitation is met by the organic acids of Hidekazu, which constitute a surface treatment. Additionally, Miyata teaches that the calcium hydroxide should be surface treated with 1 to 10% by weight of an anionic surfactant, (abs) and enumerates these agents, (col 4 ln 7-21) which correspond to applicants group (a) - (e), (g) and (h).

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31. Claim 18 requires that the resin is a polyvinyl chloride or fluorocarbon rubber.

Miyata teaches that the resins used in the invention (col 4 ln 22-55) include polyvinyl chloride (col 4 ln 33) and fluorine-containing rubber (col 4 ln 50).

32. Claim 19 requires that the resin comprise 0.1 to 10 parts by weight of hydrotalcite. Miyata teaches that additional additives other than calcium hydroxide may be used, including perchlorate type hydrotalcite and CO_3 type hydrotalcite. (col 5 ln 19-20) Miyata indicates that these compounds would be for thermal stabilization and are generally used and well known additives. (col 5 ln 7-20) It would therefore be obvious to one of ordinary skill in the art to add a typical amount and to optimize that amount for the purpose of thermal stabilization. Applicant also indicates that the purpose of the hydrotalcite is to resist thermal degradation (ie. thermal stability). (applicant's ¶78) It is reasonable to expect that both Miyata and applicant would arrive at a similar effective concentration.

33. Claim 21 requires the resin of claim 19 where the weight ratio of calcium hydroxide to hydrotalcite is 1/9 to 9/1. The composition of Miyata meets the limitation of 0.1 to 10 parts by weight of calcium hydroxide to 100 parts of resin, and as discussed above (Action ¶32), it is reasonable to expect that Miyata would arrive at an effective concentration in the range 0.1 to 10 parts by weight of hydrotalcite per 100 parts of resin. This essentially covers a range of 0.1/10 to 10/0.1 and points between. This is slightly larger than applicant's range, but essentially teaches the same effective ratios.

34. Claim 24 teaches a molded article comprising the resin composition of claim 12. Miyata teaches that any molding method may be used, appropriate to the resin (col 4 ln

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65-68) and the kind of molded article desired. (col 5 ln 1-6) This clearly demonstrates the intent to use the resin composition to generate a molded article.

35. Claim 26 requires the stabilizer of claim 25 (a calcium hydroxide compound as described in claim 1), further comprising hydrotalcite and having a CH/HT weight ratio of 1/9 to 9/1. This is the subject matter of claim 21. Both the calcium hydroxide and the hydrotalcite are indicated to improve the thermal degradation of the resin. These compounds would act together to improve the stability of the resin, thereby as a stabilizer. This characteristic is inherently met by the subject matter of claim 21.

36. Claims 20, 23, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyata et al. (US 6,592,834) in view of Hidekazu et al. (JP 09-278435) as applied to claims 12-13 and 15-19 above, and further in view of Katsuki et al. (US 6,291,570)

Description and Relationship of the Prior Art

37. Miyata teaches that perchlorate type hydrotalcite and CO_3 type hydrotalcite may be incorporated in the resin in order to provide thermal stability. (col 5 ln 1-20) Miyata fails to specifically teach a molecular formula or treatment of these particles prior to incorporation in the resin, rather indicating that this is a generally used additive. (col 5 ln 7-20) This indicates that it would be expected for one of ordinary skill in the art to select a hydrotalcite and to treat it appropriately in order to incorporate it into the resin composition.

38. Katsuki teaches a heat deterioration resistant resin composition which incorporates a hydrotalcite of a specific formula, $\text{M}_{1-x}\text{Al}_x(\text{OH})_2\text{A}^{n-}_{x/n}\cdot\text{H}_2\text{O}$. This

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hydrotalcite is designed for the purpose of improving the heat deterioration resistance of a synthetic resin. (col 3 ln 37-60) While Katsuki teaches a halogen-free synthetic resin (ie. not PVC or fluorine-rubber), (col 7 ln 45) the intent is to improve on prior art which experiences difficulties during molding or when ignited due to the halogen content of the resin. (col 1 ln 46-55) This does not preclude the hydrotalcite from being used in the resin because there is no teaching which suggests that the hydrotalcite would not function in a halogenated resin, simply that a halogenated resin is not preferred due to its inferior combustion and processing properties with regard to the release of halogen gas. For one of ordinary skill in the art looking for an improved hydrotalcite to apply to Miyata's invention, where a hydrotalcite is already indicated, it would be obvious to consider the invention of Katsuki for its improved ability to confer resistance to heat deterioration.

With Regard to the Claims

39. Claim 20 requires a resin composition as described by claim 19, where the hydrotalcite has the formula $(Mg)_y(Zn_z)_{1-x}(Al)_x(OH)_2A^{n-}_{x/n} \cdot mH_2O$. Katsuki teaches the formula $M_{1-x}Al_x(OH)_2A^{n-}_{x/n} \cdot H_2O$ where M can be Mg or Zn. Mg is preferably greater than Zn, which is consistent with applicant's requirement that Y is 0.5 to 1 and Z is 0 to 0.5. Katsuki teaches that X is 0 to 0.5 and m is 0 to 1, which is also consistent with applicant's requirements. Katsuki indicates that A^{n-} may be CO_3^{2-} , or an oxyacid anion of S. That is consistent with applicants CO_3^{2-} and SO_4^{2-} . (col 3 ln 50 – col 4 ln 21) Miyata teaches a perchlorate or CO_3 type hydrotalcite. (col 5 ln 19-20) The anion used in the formula would be relatively minor to alter, so it would be facile to use a

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perchlorate anion in the place of one taught by Katsuki when utilizing the hydrotalcite in the invention of Miyata. This is consistent with applicant's third anion, ClO_4^- .

40. Claim 23 requires that the hydrotalcite is surface-treated with a surface treating agent selected from the list presented. Katsuki teaches that the hydrotalcite is preferably blended with a surface treatment agent before being combined with a resin. For surface treating agents, Katsuki teaches higher fatty acids, anionic surfactants, phosphoric acid esters, coupling agents (including silcate-, titanate-, and aluminum-based), and esters of polyhydric alcohols and fatty acids.

41. Claim 27 requires the stabilizer of claim 25, where the hydrotalcite is represented by the formula given in claim 20. This composition is met by the subject matter of claim 20. Both the hydrotalcite and the calcium hydroxide are known to act as stabilizers in a resin composition with respect to thermal degradation. The requirement for the composition, acting as a stabilizer, is therefore met by the arguments made with respect to claim 20.

42. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyata et al. (US 6,592,834) in view of Hidekazu et al. (JP 09-278435) as applied to claims 12-13 and 15-19 above, and further in view of Katsuki et al. (US 6,291,570) with support from Miyata et al. (US 3,879,525) and Kooli et al. (J. Mat. Sci, 1993)

43. Claim 22 requires that the hydrotalcite is calcined at 200°C or higher. Katsuki teaches that the method and condition for producing the hydrotalcite is not limited as long as certain conditions are obtained. (col 5 ln 5-19) Katsuki directs the reader to

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methods which are known and will produce source materials (hydrotalcite) in accordance with the invention, including the work of Miyata '525. Calcination is a thermal treatment designed to bring about thermal decomposition, phase transition, or purification, which takes place at or above the thermal decomposition temperature. Miyata '525 provides the thermal decomposition temperature for a variety of hydrotalcites containing zinc and aluminum. (Table 10)

Table 10

Kind of product	Decomposition temperature (°C.) (according to D.T.A. analysis)
$Zn_2Al_2(OH)_6SO_4 \cdot 3H_2O$	260
$Zn_2Al_2(OH)_6Cr_2O_7 \cdot 3H_2O$	320
$Zn_2Al_2(OH)_6CrO_4 \cdot 3H_2O$	290
$Zn_2Al_2(OH)_6S_2O_8 \cdot 1.5H_2O$	300
$Zn_2Al_2(OH)_6S_2O_8 \cdot 3H_2O$	290
$Zn_2Al_2(OH)_6SO_4 \cdot 4H_2O$	245
$Zn_2Al_2(OH)_6B_2O_5 \cdot 6H_2O$	300

It is obvious from this table that many hydrotalcites have decomposition temperature in the range 250-325°C. Kooli also provides data for Mg-Zn-Al hydrotalcite like compounds. Based on DTA analysis, a peak is noted between 150 and 180°C (used to determine decomposition temperatures, see Miyata '525) In both of these cases, in order to perform calcination at a temperature above the decomposition temperature, as is the well known protocol, it would be mandatory to perform the operation at a temperature at or above 200°C.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darcy D. LaClair whose telephone number is (571)270-5462. The examiner can normally be reached on Monday-Thursday 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 4171

Darcy D. LaClair
Examiner
Art Unit 4171

/DDL/